

REMARKS

As applicant's previous attorney has withdrawn from further action in the above application, a new Power of Attorney naming James A. Geppert as applicant's attorney accompanies the present Amendment and applicants requests the approval and entry of this Power of Attorney in this application. Please direct all future communication in this application to the newly named attorney.

Responsive to the Office Action of August 14, 2002, applicant has amended the specification and abstract to correct the errors pointed out by the Examiner, and to add reference numerals 20, 23, 24, 25, 26, 31 and 32 on page 9 and correct the numeral "5" to "45" in line 1 of page 11. These changes are believed to overcome the objections of the Examiner to the drawings, specification and abstract. Applicant wishes to point out that reference numeral 13 not found by the Examiner in the specification appears in line 10 of page 10.

In view of the various objections and rejections, applicant has amended Claims 1 through 3, 6, 11 and 14 and added Claims 15 through 19. Also, applicant has cancelled Claim 4, and Claim 7 has been withdrawn from further consideration as directed to a non-elected invention.

Applicant hereby affirms that restriction was required between Claims 1 through 6 and 8 through 14 directed to soldering machines and Claim 7 directed to an oil pouch and, in a telephone conversation with applicant's attorney, Bryan Lempia, Claims 1 through 6 and 8 through 14 were elected for further prosecution in the present application without traverse.

With respect to the Office Action, the Examiner objects to Claim 11 as being of improper dependent form by reciting only the intended use of the soldering machine without further limitations to the machine. This claim has been amended to recite a means plus a function of such means for use in the soldering machine, which type of limitation is accepted by the Patent and Trademark Office.

The Examiner has rejected Claims 1 through 4 and 8 through 14 as indefinite for omitting essential structural cooperative relationships between the elements of the machine. To overcome this rejection, applicant has amended the claims to remove any reference to computer controls for the soldering machine, and to more completely define the present invention. As to the objection to Claim 3, this claim has been amended to redefine the fact that a machine operator, production setup person or computer operator can manually control various adjustments of the soldering machine. Also, with respect to Claims 8 and 11, applicant has revised these claims to recite means to heat the solder tip of the machine and to provide a short pulse of current to the tip. Applicant believes these amendments provide sufficient structural basis for these claims.

Claims 1 through 4 were rejected under 35 U.S.C. 103(a) as unpatentable over the Kerr et al. patent in view of the Hall patent. The Kerr et al. patent relates to a soldering apparatus with a variable feed where the solder wire is fed by a drive roller 191 and an idler roller 192 with the drive roller intermittently feeding the wire by friction of the rollers. However, this wire feeding mechanism is not a positive feeding means such as the device disclosed and claimed by applicant where cams actuate the wire feed mechanism. The Hall patent was cited to show a computer controlled soldering process, however, as applicant has deleted the computer control from these claims, the Hall patent

does not add any structural elements to Kerr et al., and applicant believes the combination of the Kerr et al. and Hall patents do not anticipate the present novel invention.

Claim 5 was rejected under 35 U.S.C. 103(a) as unpatentable over the patent to Evans in view of the Maguire patent. The Evans patent was cited by the Examiner to show a wire feed apparatus having a rigid guide rail and an oscillating bar with a sharp point to engage the wire for forward motion thereof, and the Maguire patent was cited for the use of a grooved drive wheel. However, applicant submits that there is a substantial difference between a grooved drive wheel and an elongated a guide rail that supports the solder wire over a substantial portion of its length for proper alignment and support of the wire into the opening in the solder tip. In view of the amendments to this claim, applicant believes that Claim 5 distinguishes over the cited prior art.

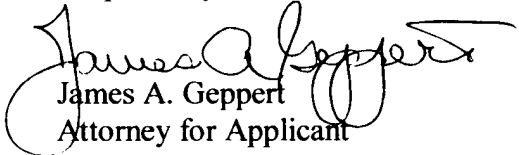
Claims 8 through 14 were rejected under 35 U.S.C. 103(a) as unpatentable over the Ledermann et al. patent or the Japanese patent. Applicant has carefully reviewed both of these citations and cannot find any reference to the times or temperatures recited in the claims under consideration. Although the Examiner takes the position that the machines of these patents were capable of these times and temperatures and thus were obvious to one skilled in the art, applicant cannot agree with the Examiner's position. Applicant calls the Examiner's attention to pages 3 and 4 and pages 11 and 12 of the specification where the reasons for the temperature ranges and times were explained, which limitations did not appear in any of the patents cited by the Examiner. Thus, Claims 8 through 14 are believed to be allowable.

Claim 6 was objected to as being dependent upon a rejected base claim, but the Examiner indicated it would be allowable if rewritten in independent form, and applicant has rewritten this claim in independent form and submits it to be allowable.

Applicant has added additional Claims 15 through 19 to depend from amended Claim 14, and these claims add further limitations to this claim, which claims are believed to be allowable.

In view of the above discussion and the amendments to Claims 1 through 3, 6, 11 and 14 and the addition of new Claims 15 through 19, an allowance of Claims 1 through 3, 5, 6, and 8 through 19 is requested.

Respectfully submitted,



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Version With Markings To Show Changes Made

In the specification:

Page 6, lines 5 – 15 rewritten as follows:

A fifth example according to the teachings of the present invention includes a solder wire feeder and an accurate wire guide mechanism. The solder wire is ductile with [low] a low beam strength, cold flows, not always straight and free of kinks and quite often becomes coated with flux. Also, the guide and feeder mechanism require accommodation for heat and flux contamination. One disclosed example consists of a rigid guide rail, which is open on the top surface, in the form of a groove. The solder wire nests within the groove and is held down with a spring, which is positioned close to the end of the rail. The spring maintains a pressure against the wire, which keeps the wire straight and deflects whenever irregularities on the wire feed through (See Fig. 2).

Page 9, lines 15 –21 rewritten as follows:

Referring to Fig. 1, a pivot plate 16 is bolted on to a shaft 15, which is supported by preloaded ball bearings 14. The plate 16 [provide] provides means to support a solder tip holder 30, a wire feed mechanism, a spool of solder wire 19 on a shaft 20, and a cam follower bearing 22. The stationary base plate 2 supports a camshaft 12, gear box 1 and pivot bearing support 3. Two cams 51 and 52, which are mounted on the shaft 12, provide the solder feed and spindle up/down motions.

Page 9, line 24 – 27 rewritten as follows:

Coolant water flows into tubes 55 and 56 through nipples 25 and 26, circulates through the lower extensions 31 and 32 of the tubes to the bottom end of the solder tip

shanks 33 and 34, upwards around the extensions 31 and 32, and exits out through tubes 53 and 54 in side nipples 23 and 24. The solder tip shanks 33 and 34 are bolted on to an insulator block 30, which in turn is rigidly mounted on to the pivot plate 16.

Page 11 lines 1 – 4 rewritten as follows:

A lever 44 pivotally mounted over pin [5] 45, which is rigidly press fitted into plate 16 [contain] ,contains a lower curved surface 42 which presses against the solder wire 18. The pressure is provided by a spring 46. This mechanism provides a calibrated friction force on the solder wire.

The Abstract of the Invention is rewritten as follows:

Abstract [of the Disclosure]

An automatic soldering machine utilizing many design features which substantially reduces maintenance, simplifies the soldering operation, improves the process reliability, reduces the cycle time, and reduces [he] the cost to fabricate such a machine.

In the claims:

Rewrite Claim 1 as follows:

1. (Amended) [A computer controlled] An automatic soldering machine comprising:

a heater to provide heat to a quantity of solder wire and to parts in a soldering position for soldering; and

means to move said heater and solder wire into the soldering position,

said means to move said heater into the soldering position includes a pivot mounted frame for supporting a heater assembly,

wherein [controls and] mechanisms [for a complete cycle sequence are not manually adjustable by a machine operator or by a production setup person] for moving the heater and solder wire are actuated by cams.

Rewrite Claim 2 as follows:

2. (Amended) Apparatus according to Claim 1, [wherein mechanisms for moving the heater and solder wire are actuated by cams] including an oil pouch for applying a coat of oil on the solder wire, said oil pouch comprising:

an oil filled, open pore sponge elastomer contained within a sealed plastic bag, wherein the pouch is positioned in the path of and is pierced by said solder wire to allow the solder wire to pass through the bag and sponge.

Rewrite Claim 3 as follows:

3. (Amended) Apparatus according to Claim [2] 1, further comprising:
various adjustments which may be controlled by a machine operator, a production setup person, or computer.

Rewrite Claim 6 as follows:

6. (Amended) [Apparatus according to Claim 5, wherein the] An apparatus for soldering comprising:

a solder wire feeder having a rigid guide rail with an axial groove for nesting and guiding solder wire; and

an oscillating bar positioned over the rail which supports a sharp point for engaging the solder wire as required for a forward feed motion;

said rigid guide rail [has] having a front end positioned within about 16 diameters of a solder wire diameter from a solder tip, and wherein the front end of the guide rail contains a biasing device which holds the solder wire within the groove.

Rewrite Claim 11 as follows:

11. (Amended) Apparatus according to Claim 10, [wherein] including means to provide a short pulse of the electrical current [is] applied to the tip simultaneously with removal of the tip away from a soldered part or parts.

Rewrite Claim 14 as follows:

14. (Amended) An apparatus for soldering comprising:
a heated solder tip[;and a solder wire feeder] wherein said solder tip is at a relatively constant temperature and has one or more holes to receive a portion of solder wire that is about 0.125 inches in diameter or less angularly positioned within the tip, and has one or more intersecting holes to allow exit of molten solder onto a part to be soldered,
a solder wire feeder acting to feed the solder wire into the tip through the angular holes; and wherein the one or more holes are of a properly designed shape, dimension, material, temperature, a controlled solder wire feed rate, and force to prevent molten solder and/or flux from ejecting out of an entrance of the one or more holes.